Preliminary report
Hurricane Hilary
17 - 21 September 1999

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Hilary briefly became a 65-knot hurricane while located about 200 n mi southwest of the southern tip of Baja California, but did not affect land.

a. Synoptic history

Hilary originated from a tropical wave that moved from west Africa to the Atlantic on 29 August. It was a weak wave with minimal organized convection as it moved across the tropical Atlantic and the Caribbean. The wave acquired some organized convection on the 10th and 11th of September while over Central America. Visible satellite imagery on the 17th showed a low-level circulation, along with some organized deep convection, and a tropical depression is estimated to have formed later that day, while centered about 475 n mi south-southeast of the southern tip of Baja California, Mexico. The best track begins on the 17th, as indicated in Table 1 which is a listing, every six hours, of best track positions, maximum one-min surface wind speeds, and minimum central surface pressure. A map of the best track positions is shown in Fig. 1.

The depression was upgraded to a tropical storm on the 18th, based on the low-level center being located under deep convection. Hilary had been moving generally west-northwestward during this time as it slowly strengthened. A deepening mid- to upper-level trough approached Hilary from the northwest and the motion turned sharply toward the north-northwest late on the 19th. A banding-type eye feature, increased symmetry, and an enlarging of deep convection are the bases for upgrading Hilary to a 65-knot hurricane for a short time early on the 20th, while centered some 200 n mi southwest of the southern tip of Baja California. Later that day, the low-level center became exposed to the south of the deep convection and Hilary weakened to a tropical storm. The cyclone moved over cool water and the weakening continued. Hilary was reduced to a swirl of low clouds, devoid of deep convection on the 21st, and the best track ends about 100 n mi west of Cabo San Lazaro, Baja California.

b. Meteorological statistics

The best track pressure and wind speed time series curves are shown in Figs. 2 and 3, along with plots of the data on which the curves are based. Satellite-based intensity estimates are the only available data, except that the ship ***SALUS*** reported a 37-knot wind speed while located about 120 n mi east of the center at 0000 UTC on the 20th.

c. Casualties and damages

Hilary did not affect land and there are no known deaths or damages.

d. Forecast and warning critique

There were 12 forecasts made while Hilary was a tropical storm and only four of these verified at 48 hours and none verified at 72 hours. The average track forecast errors were 45 n mi at 12 hours (10 cases), 81 n mi at 24 hours (8 cases), 119 n mi at 36 hours (6 cases) and 194 n mi at 48 hours (4 cases). These errors are somewhat higher that the previous 10-year averages for the eastern Pacific basin. This is probably related to the sharp right turn described above and the resultant left bias of the official forecasts. Wind speed forecast errors were modestly small as the intensification and weakening of Hilary were well-forecast.

Table 1. Preliminary Best Track, Hurricane Hilary, 17-21 September 999.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
17/0600	15.2	107.1	1006	25	tropical depression
1200	15.6	107.9	1006	25	
1800	16.0	108.8	1005	25	
18/0000	16.2	109.7	1004	30	“
0600	16.2	110.5	1003	30	“
1200	16.2	111.3	1002	35	tropical storm
1800	16.4	111.8	1001	40	“
19/0000	16.8	112.2	999	45	“
0600	17.5	112.5	995	50	“
1200	18.5	112.8	992	55	“
1800	19.7	113.1	989	60	“
20/0000	20.7	113.6	988	65	hurricane
0600	21.6	114.0	987	65	“
1200	22.4	114.3	988	60	tropical storm
1800	23.0	114.5	991	55	“
21/0000	23.6	114.6	995	45	“
0600	24.3	114.6	999	40	“
1200	24.9	114.6	1003	30	tropical depression
1800	25.3	114.5	1006	25	“
22/0000	dissipated				
20/0600	21.6	114.0	987	65	minimum pressure

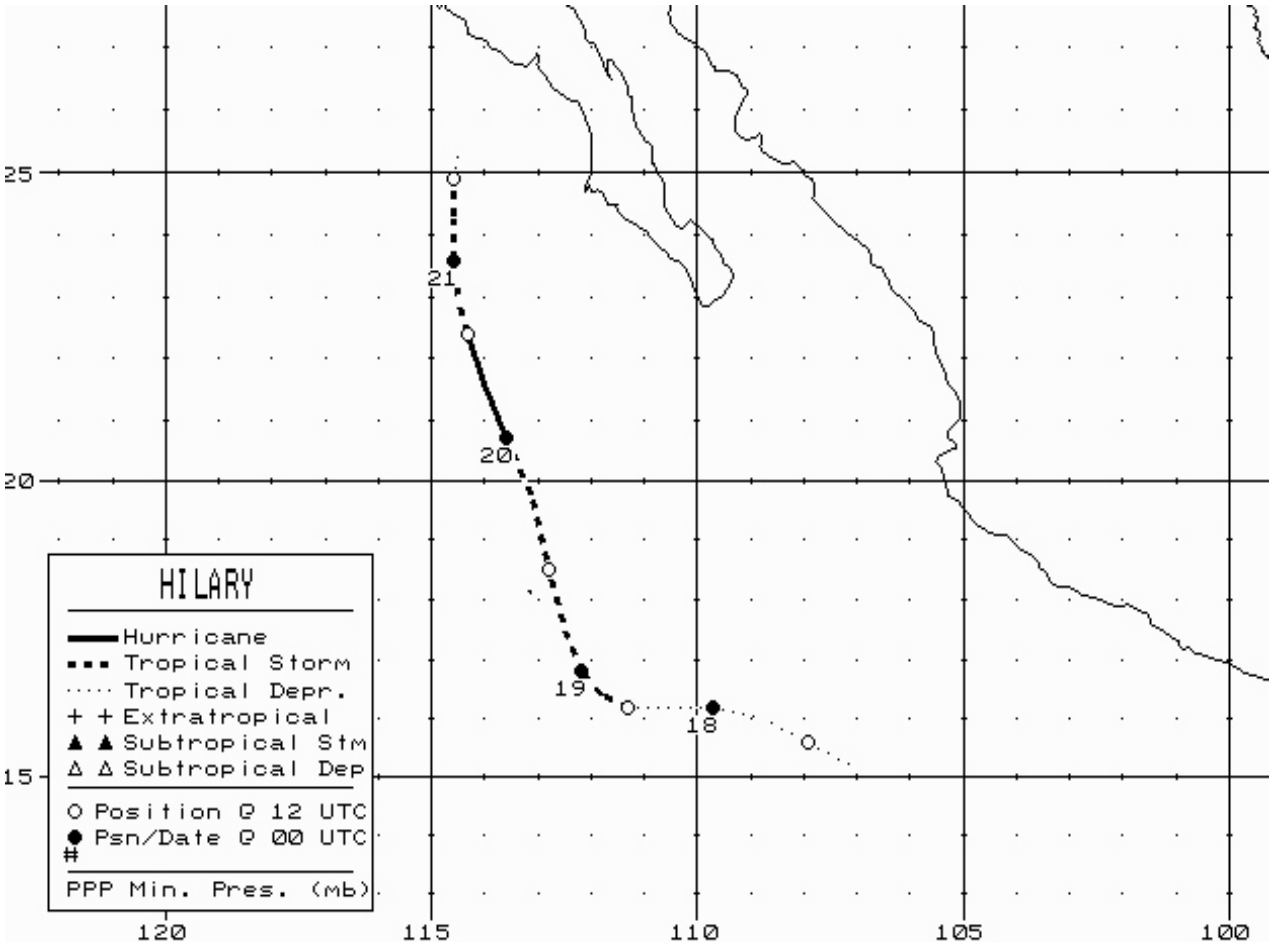

Fig. 1. Best track positions for Hurricane Hilary, 17-21 September 1999.

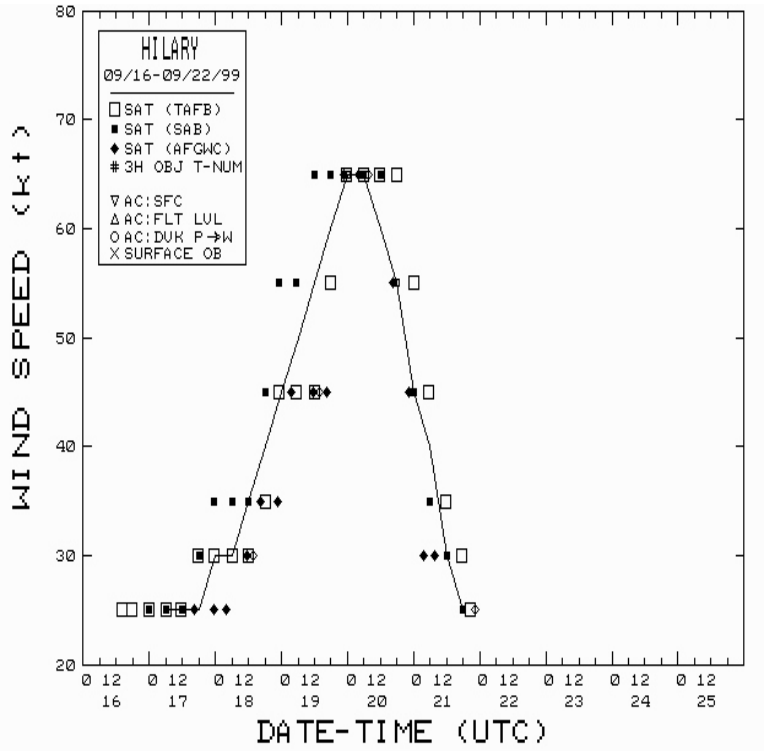

Fig. 2. Best track maximum 1-min sustained wind speed curve for Hurricane Hilary.

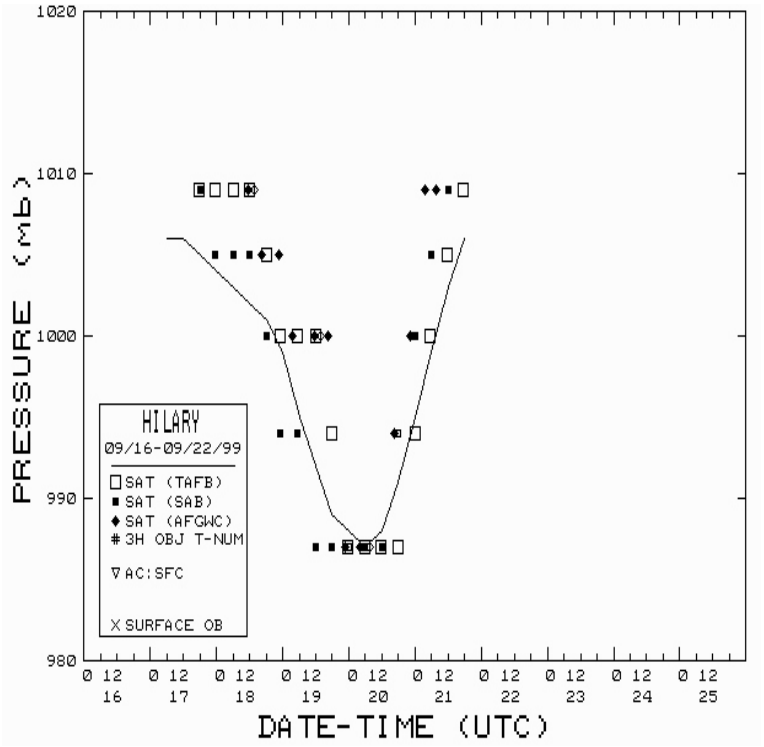

Fig. 3. Best track minimum central surface pressure curve for Hurricane Hilary.